

REMARKS

In the non-final Office Action, the Examiner rejects claims 1-16 and 27-40 under 35 U.S.C. § 102(a) as anticipated by QUIGLEY et al. (U.S. Patent Application Publication No. 2001/0055319); rejects claims 17-21 under 35 U.S.C. § 103(a) as unpatentable over QUIGLEY et al. in view of ODMAN et al. (U.S. Patent Application Publication No. 2003/0137966); and rejects claims 22-26 and 41 under 35 U.S.C. § 103(a) as unpatentable over QUIGLEY et al. in view of MILLET et al. (U.S. Patent No. 7,039,939). The rejections are respectfully traversed.

By way of the present amendment, Applicant amends claims 17, 19, and 20 to improve form and cancels claims 18 without prejudice or disclaimer. No new matter has been added by way of the present amendment. Claims 1-17 and 19-41 are pending.

Rejection under 35 U.S.C. § 102(a) based on QUIGLEY et al.

Claims 1-16 and 27-40 stand rejected under 35 U.S.C. § 102(a) as anticipated by QUIGLEY et al. The rejection is respectfully traversed.

A proper rejection under 35 U.S.C. § 102 requires that a single reference teach every aspect of the claimed invention. Any feature not directly taught must be inherently present. See M.P.E.P. § 2131. QUIGLEY et al. does not disclose or suggest one or more of the features recited in claims 1-16 and 27-40.

Independent claim 1 recites a method of altering modem transmission characteristics. The method includes setting a modem to transmit on a first upstream channel on a first frequency using first transmission characteristics; monitoring a quality of upstream transmissions from the modem on the first upstream channel; and setting the modem to transmit on a second different upstream channel on a second different frequency using second transmission characteristics based on the monitored quality. QUIGLEY et al. does not disclose or suggest one or more of these features.

For example, QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency using second transmission characteristics based on a monitored quality from the modem on a first upstream channel, as recited in claim 1. The Examiner relies on Figs. 27, 29, and 31-33 and paragraph 0340 (which describes Fig. 29) of QUIGLEY et al. as allegedly disclosing this feature of claim 1 (Office Action, pg. 3). Applicant disagrees with the Examiner's interpretation of QUIGLEY et al.

At Fig. 27, QUIGLEY et al. discloses that, when a quality of a channel is determined to be less than that of a predetermined threshold, a second modulation method, which uses a lower data rate than a first modulation rate, is utilized (paragraph 0321). This section of QUIGLEY et al. does not disclose or suggest transmitting on a second different upstream channel based on a monitored quality of a first upstream channel. Using a second modulation method does not correspond to transmitting on a second different upstream channel based on a monitored quality of a first upstream channel. Therefore, Fig. 27 of QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency using second transmission characteristics based on a monitored quality from the modem on a first upstream channel, as recited in claim 1.

At Fig. 31, QUIGLEY et al. discloses that the use of fine frequency agility facilitates the precise definition of upstream channels so that usable upstream bandwidth is enhanced (paragraph 0355). This section of QUIGLEY et al. discloses the use of fine frequency agility on an upstream channel. This section of QUIGLEY et al. does not disclose or suggest transmitting on a second different upstream channel based on a monitored quality of a first upstream channel. Therefore, Fig. 31 of QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency using second

transmission characteristics based on a monitored quality from the modem on a first upstream channel, as recited in claim 1.

At Fig. 32, QUIGLEY et al. discloses that, when a signal-to-noise ratio is less than a predetermined threshold, then the symbol rate and constellation for a new, unused upstream channel is determined and a channel reallocation message is sent to all cable modems in the frequency channel (paragraph 0366). This section of QUIGLEY et al. discloses reallocating modems in a same frequency. This section of QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency. Rather, this section of QUIGLEY et al. merely discloses reallocating to a new channel. Therefore, Fig. 32 of QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency using second transmission characteristics based on a monitored quality from the modem on a first upstream channel, as recited in claim 1.

At Fig. 33, QUIGLEY et al. discloses that, if a signal-to-noise ration is not greater than a QPSK threshold, then a next available channel is assigned as the new channel for upstream transmission (paragraph 0373). This section of QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency. Rather, this section of QUIGLEY et al. merely discloses assigning a new channel. Therefore, Fig. 33 of QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency using second transmission characteristics based on a monitored quality from the modem on a first upstream channel, as recited in claim 1.

At paragraph 0340, QUIGLEY et al. discloses:

When the quality of a channel is determined to be sufficiently poor (such that even QPSK will not provide reliable data transmission), then that channel may be moved to a

different frequency allocation. When this occurs, the new upstream channel frequency is transmitted to the upstream burst receiver 333 and is also transmitted to the affected cable modem via downstream message flow.

This section of QUIGLEY et al. discloses that when the quality of a channel is sufficiently poor, then the channel is moved to a different frequency allocation. This section of QUIGLEY discloses changing a frequency allocation of a channel and does not disclose or suggest setting a modem to transmit on a second different upstream channel. Therefore, this section of QUIGLEY et al. does not disclose or suggest setting a modem to transmit on a second different upstream channel on a second different frequency using second transmission characteristics based on a monitored quality from the modem on a first upstream channel, as recited in claim 1.

For at least the foregoing reasons, Applicant submits that claim 1 is not anticipated by QUIGLEY et al.

Claims 2-8 depend from claim 1. Therefore, these claims are not anticipated by QUIGLEY et al. for at least the reasons given above with respect to claim 1.

Independent claims 9, 27, 30, 33, and 37 recite features similar to, yet possibly of different scope than, features recited above with respect to claim 1. Therefore, these claims are not anticipated by QUIGLEY et al. for at least reasons similar to the reasons given above with respect to claim 1.

Claims 10-16 depend from claim 9. Therefore, these claims are not anticipated by QUIGLEY et al. for at least the reasons given above with respect to claim 9.

Claims 28 and 29 depend from claim 27. Therefore, these claims are not anticipated by QUIGLEY et al. for at least the reasons given above with respect to claim 27.

Claims 31 and 32 depend from claim 30. Therefore, these claims are not anticipated by QUIGLEY et al. for at least the reasons given above with respect to claim 30.

Claims 34-36 depend from claim 33. Therefore, these claims are not anticipated by QUIGLEY et al. for at least the reasons given above with respect to claim 33.

Claims 38-40 depend from claim 37. Therefore, these claims are not anticipated by QUIGLEY et al. for at least the reasons given above with respect to claim 37.

Rejection under 35 U.S.C. § 103(a) based on QUIGLEY et al. and ODMAN et al.

Pending claims 17 and 19-21 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over QUIGLEY et al. in view of ODMAN et al. Applicant respectfully traverses this rejection.

Amended independent claim 17 recites a method of controlling transmission characteristics of cable modems. The method includes periodically broadcasting a plurality of upstream channel descriptors to one or more downstream channels, each of the plurality of upstream channel descriptors describing different transmission characteristics, monitoring upstream transmission quality of one or more cable modems, each of the cable modems associated with an upstream channel descriptor of the plurality of upstream channel descriptors; and commanding, based on the monitored quality, at least one of the one or more cable modems to change its transmission characteristics by selecting a different upstream channel descriptor of the plurality of channel descriptors, where changing its transmission characteristics includes transmitting on a different upstream virtual channel and changing from a first preamble length to a second different preamble length. QUIGLEY et al. and ODMAN et al., whether taken alone or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, QUIGLEY et al. and ODMAN et al. do not disclose or suggest commanding, based on a monitored quality, at least one of the one or more cable modems to change its transmission characteristics by selecting a different upstream channel descriptor of the plurality of channel descriptors, where changing its transmission characteristics includes

transmitting on a different upstream virtual channel and changing from a first preamble length to a second different preamble length, as recited in amended claim 17. A similar feature was previously presented in claim 18 (now canceled). The Examiner relies on paragraph 0340 of QUIGLEY et al. as allegedly disclosing commanding the at least one of the one or more cable modems to transmit on a different upstream virtual channel based on a monitored quality and relies on paragraph 0080-0082 of ODMAN et al. as allegedly disclosing changing from a first preamble length to a second different preamble length (Office Action, pp. 10-11). Applicant submits that neither these sections, nor any other sections, of QUIGLEY et al. and ODMAN et al. disclose or suggest the above feature of amended claim 17.

As noted above, at paragraph 0340, QUIGLEY et al. discloses that when the quality of a channel is sufficiently poor, then the channel is moved to a different frequency allocation. This section of QUIGLEY discloses changing a frequency allocation of a channel and does not disclose or suggest transmitting on a different upstream virtual channel. Furthermore, this section of QUIGLEY et al. does not disclose or suggest selecting a different upstream channel descriptor. Therefore, this section of QUIGLEY et al. does not disclose or suggest commanding, based on a monitored quality, at least one of the one or more cable modems to change its transmission characteristics by selecting a different upstream channel descriptor of the plurality of channel descriptors, where changing its transmission characteristics includes transmitting on a different upstream virtual channel and changing from a first preamble length to a second different preamble length, as recited in amended claim 17.

At paragraphs 0080-0082, ODMAN et al. discloses:

A preamble is used at the beginning of each frame transmitted between two devices 310, 320 for receiver acquisition. The preamble allows the receiving device to lock onto and synchronize with the transmitting device, and to train itself so that it knows how to extract the modulated payload out of the frame. Depending upon the media quality and the transmission parameters, this preamble could be varied in length. For example, if the media conditions were such that signal quality was poor, a longer preamble might be

needed to allow more time to prepare the receiver to process the incoming frame. If, however, the media conditions were good such that signal quality was poor, the frame could afford a shorter preamble.

A feature of the present invention is that the length of the preambles in PMD may be changed as needed.

In one preferred embodiment, the network 310 will start with a default short preamble and change to a long preamble during bad media quality transmissions. In alternate embodiments, however, the network 300 could start with a long preamble and switch to a short preamble during good media quality transmissions to make sure initial packets are safely transmitted. In other embodiments some portions of the superframe 500, 710, e.g., the beacon and MTS, could always use long preambles to ensure their successful transmission in all circumstances.

This section of ODMAN et al. discloses changing the length of preambles based upon signal quality. This section of ODMAN et al. does not disclose or suggest transmitting on a different upstream virtual channel. Furthermore, this section of ODMAN et al. does not disclose or suggest selecting a different upstream channel descriptor. Therefore, this section of ODMAN et al. does not disclose or suggest commanding, based on a monitored quality, at least one of the one or more cable modems to change its transmission characteristics by selecting a different upstream channel descriptor of the plurality of channel descriptors, where changing its transmission characteristics includes transmitting on a different upstream virtual channel and changing from a first preamble length to a second different preamble length, as recited in amended claim 17.

For at least the foregoing reasons, Applicant submits that claim 17 is patentable over QUIGLEY et al. and ODMAN et al., whether taken alone or in any reasonable combination.

Pending claims 19-21 depend from claim 17. Therefore, Applicant submits that these claims are patentable over QUIGLEY et al. and ODMAN et al., whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 17.

Rejection under 35 U.S.C. § 103(a) based on QUIGLEY et al. and MILLET et al.

Claims 22-26 and 41 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over QUIGLEY et al. in view of MILLET et al. Applicant respectfully traverses this rejection.

Independent claim 22 recites a cable modem termination system that includes a memory to store instructions; and a processor to execute the instructions in the memory to: monitor upstream transmission quality of one or more cable modems, and instruct at least one of the one or more cable modems to change its transmission characteristics, including changing from a first time division multiplexed timeslot size to a second different time division multiplexed timeslot size, when the monitored quality meets a specified criteria. QUIGLEY et al. and MILLET et al., whether taken alone or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, QUIGLEY et al. and MILLET et al. do not disclose or suggest a processor to execute instructions in memory to instruct at least one of the one or more cable modems to change its transmission characteristics, including changing from a first time division multiplexed timeslot size to a second different time division multiplexed timeslot size, when the monitored quality meets a specified criteria. The Examiner admits that QUIGLEY et al. does not disclose this feature and relies on elements 716 and 718, column 11, line 17 – column 12, line 35, and column 14, line 67 – column 15, line 51 (which describes elements 716 and 718) of MILLET et al. as allegedly disclosing this feature of claim 22 (Office Action, pg. 12). Applicant respectfully disagrees with the Examiner's interpretation of MILLET et al.

At column 11, line 17 – column 12, line 35, MILLET et al. discloses that an upstream signal quality is compared to a threshold signal quality level. If the signal quality of the upstream band being used by the selected modem is less than the threshold, the MAC layer

assigns another time slot to the selected modem. If the signal quality is above the threshold level, it is considered an acceptable upstream band. Assigning another time slot does not correspond to changing from a first time division multiplexed timeslot size to a second time division multiplexed timeslot size. MILLET et al. does not disclose that the other time slot is of a different size than the first time slot. Therefore, this section of MILLET et al. does not disclose or suggest a processor to execute the instructions in the memory to instruct at least one of the one or more cable modems to change its transmission characteristics, including changing from a first time division multiplexed timeslot size to a second different time division multiplexed timeslot size, when the monitored quality meets a specified criteria, as recited in claim 22.

At column 14, line 67 – column 15, line 51, MILLET et al. discloses a time slot 714 that includes a first test period 716 and a second test period 718. MILLET et al. further discloses that, after time slot 714, the CMTS can determine on which frequency to transmit. In other words, this section of MILLET et al. disclosing running tests to determine the best frequency on which to transmit. This section of MILLET et al. does not disclose or suggest changing from a first time division multiplexed timeslot size to a second different time division multiplexed timeslot size. In fact, this section of MILLET et al. has nothing to do with a time division multiplexed timeslot size at all. Therefore, this section of MILLET et al. does not disclose or suggest a processor to execute the instructions in the memory to instruct at least one of the one or more cable modems to change its transmission characteristics, including changing from a first time division multiplexed timeslot size to a second different time division multiplexed timeslot size, when the monitored quality meets a specified criteria, as recited in claim 22.

For at least the foregoing reason, Applicant submits that claim 22 is patentable over QUIGLEY et al. and MILLET et al., whether taken alone or in any reasonable combination.

Claims 23-26 depend from claim 22. Therefore, these claims are patentable over QUIGLEY et al. and MILLET et al., whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 22.

Independent claim 41 recites features similar to, yet possibly of different scope than, features recited above with regard to claim 22. Therefore, claim 41 is patentable over QUIGLEY et al. and MILLET et al. for at least reasons similar to the reasons given above with respect to claim 22.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests the Examiner's reconsideration of the application and the timely allowance of the pending claims. If the Examiner does not believe that all pending claims are now in condition for allowance, the Examiner is urged to contact the undersigned to expedite prosecution of this application.

As Applicant's remarks with respect to the Examiner's rejections overcome the rejections, Applicant's silence as to certain assertions by the Examiner in the Office Action or certain requirements that may be applicable to such rejections (e.g., whether a reference constitutes prior art, reasons to modify a reference and/or combine references, assertions as to dependent claims, etc.) is not a concession by Applicant that such assertions are accurate or that such requirements have been met, and Applicant reserves the right to dispute these assertions/requirements in the future.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

HARRITY & HARRITY, LLP

By: /Meagan S. Walling, Reg. No. 60,112/
Meagan S. Walling
Reg. No. 60,112

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11350 Random Hills Road
Suite 600
Fairfax, Virginia 22030
Telephone: (571) 432-0841
Facsimile: (571) 432-0808

CUSTOMER NO. 44987